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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,776	07/15/2003	Michael R. Matthews	58398US002	8779
32692	7590	06/18/2004	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			KIANNI, KAVEH C	
PO BOX 33427			ART UNIT	
ST. PAUL, MN 55133-3427			PAPER NUMBER	
			2877	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	10/619,776	MATTHEWS, MICHAEL R.	
	Examin r	Art Unit	
	Kevin C Kianni	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 23 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-3 and 5-19 is/are rejected.
- 7) ☐ Claim(s) 4 and 20-22 is/are objected to.
- 8) ☐ Claim(s) 23 and 24 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application contains claims directed to the following patentably distinct species of the claimed invention: Invention group I, claims 1-22, directed to varying a point impingement locations of the first and second write beams on the first and second reflectors; while invention group (II), claims 23-24, directed to varying a point of impingement of the input beam on the beam splitter to vary the angle of intersection of the first and second write beams, thereby altering the periodicity of the interference pattern in the optical waveguide. Thus, invention group I claims would require a different search than that group invention II.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Art Unit: 2877

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with MS. Melanie Gover on 6/15/04 a provisional election was made with traverse to prosecute the invention of Group 1, claims 1-22. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Allowable Subject Matter

3. Claims 4 and 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4 and 20 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the beam splitter and the first and second reflectors are integrated in a single structure in combination with the rest of the limitations of the base claim. Claims 21-22 depend on claim 20 and therefore they are also allowable.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 and 5-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammon et al. (US 6548225).

Regarding claims 1 and 6-8, 10-11, 13 and 17-19, Hammon teaches an interferometer (shown in at least fig. 3) comprising:

a light source for providing an input beam (see 2, item UV light 31 and see col. 1, 6th parag., wherein the laser device provides UV light);

a beam splitter 32 for producing first 33 and second 38 write beams from an input beam 31 ; first 35 and second 37 reflectors for receiving the first 33 and second 38 write beams, respectively, from the beam splitter 32 and directing the first 33 and second write beams 38 to intersect at a fixed location with an angle of intersection which is a function of impingement locations of the first 33 and second 38 write beams on the first 35 and second 37 reflectors, respectively (shown in fig. 3, items reflected beams 33,38 intersect at a fixed location with an angle which is function of impinging of the beams to movable/rotatable reflector 35,37), and means/tuning element: (A) for varying a point impingement locations of the first and second write beams on the first and second reflectors (see col. 4, line 56-col. 5, line 11+, wherein by rotating/moving the mirrors the locations of the

Art Unit: 2877

beams impinging upon the mirrors changes accordingly), (B) for varying a point of impingement of the input beam on the beam splitter 51 to vary the impingement locations of the first and second write beams on the first and second fixed reflectors (shown in at least fig. 3, item translatable/tunable element 53; see col. 4, lines 56-65, see also the fixed mirrors 88/89 in fig. 5); first and second reflectors 35, 37 have a flat surface of incidence.

However, Hammon does not explicitly/specifically teach wherein the above interferometer is tunable, wherein the tunable element comprises an acousto-optic modulator capable of providing angle tuning of the input beam and at least one lens located between the tuning element and the beam splitter and that the above splitter is a 50/50 beam splitter, and wherein the first and second reflectors are curved and/or planar; wherein the above reflectors have a curved surface of incidence.

Nevertheless, Hammon states that the interferometer lengths and/or location of intersection of the beams, constituting the arms of interferometer, are variable (see at least col. 2, last parg.) and that the tunable element 53 comprises a rotatable mirror 52 capable of providing angle tuning of the input beam 31 (see fig. 3, item 52 and col. 4, line 56-col. 5, line 11) and that the splitter 51 splits the input beam 31 to two write beams 33 and 38 and that the first and second reflectors 35, 37 have a flat surface of incidence. It is well known/obvious to a person of ordinary skill in the art that translating or varying the optical path in an interferometer is known/obvious to be a tuning interferometer, and that it would have been obvious to a person of ordinary skill

Art Unit: 2877

in the art when the invention was made to modify Hammon's optical tuning device/modulator 53 by replacing it with a conventional/well known—see prior art: acousto-optic modulator and to locate least one lens between the tuning element and the beam splitter, and choose as a matter of design choice chose the splitter 51 to be a 50/50 splitter and the mirrors 35, 37 to be curved shape and/or planar, since--notwithstanding such optical tuning produces essentially the same optical result/function/effect as in Hammon's optical grating system-- it controls the period and position of interference pattern with predetermined requirements so as to produce the grating structure (see col. 3, lines 38-43) and since it has been held that omission of an element and its function in a combination where the remaining elements perform the same function as before involves only routine skill in the art. In re Karlson, 136 USPQ 184.

Regarding claims 2-3, 5, 9, 12 and 14, Hammon further teaches Wherein the means for varying the impingement location comprises a tuning element for varying a point of impingement of the input beam on the beam splitter to cause the impingement locations of the first and second write beams on the first and second reflectors to vary (shown in at least fig. 3, item translatable/tunable element 53; see col. 4, lines 56-65); wherein the first and second reflectors have fixed positions (see fig. 5, item reflectors 88 and 89 having fixed positions); wherein the tuning element 53 comprises a rotatable mirror 52; wherein the beam splitter comprises a phase mask 32; wherein the input beam is a laser beam (see at least col. 1, 1st parag.+).

Regarding claim 15-16, Hammon further teaches a device 83 for causing relative longitudinal motion of the optical waveguide with respect to the fixed location to create chirped gratings (see fig. 5, items 82 and 83; see col. 5, line 62-col. 6, line 9+); wherein the tuning element is a rotating mirror mounted on a piezoelectric element (see col. 4, last parag. and col. 7, line 64-col. 8, line 15);

Citation of Relevant Prior Art

6. Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Erdogan et al. 5694248	Teaches mirror(s) that is/are curved and planar
Bang 6676846	Teaches using lens(s) in a waveguide grating system
Shirley 6690474	Teaches acousto-optic modulator in a waveguide grating system
Napier et al. 5822479	Teaches acousto-optic modulator in a waveguide grating system
Hartog	Teaches acousto-optic modulator in a waveguide grating system
Velsko 5841570	Teaches acousto-optic modulator in a waveguide grating system
Quellette 6414764	Teaches at least claims 1 and 13
Sahlgren WO 02/07113	Teaches at least claims 1 and 13
Geln et al. 4807950	

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

Art Unit: 2877

C ntact Informati n

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021
South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.



K. Cyrus Kianni
Patent Examiner
Group Art Unit 2877

June 14, 2004